INNOVATION ON THE SKIDS: A decade-long decline in U.S. technological competitiveness won't be easy to reverse. PAGE 36

COMPUTERWORLD®

ERASING YOUR TRACKS

Can you expunge your online past? Read what happened when we tried.
PAGE 26

Inside

NOVEMBER 17/24, 2008
VOL. 42, NO. 46 $5/COPY

News Analysis

NASA has developed technology over the past 50 years that is now entrenched in IT and consumer products. PAGE 12

The drumbeat of bad economic news keeps getting louder in the IT industry. PAGE 18

THE GRILL: MIT's JoAnne Yates looks at information overload and 'CrackBerry' addiction. PAGE 20

Opinions

The new MacBook will pave Apple's way into the enterprise – even against IT's wishes. PAGE 24

What does the next generation of Web browsers mean for IT? More than you're prepared for. PAGE 48

Careers

'Fail spectacularly!' and other advice for Gens X and Y. PAGE 44

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Microsoft SQL Server 2008

Inside

COMPUTERWORLD ■ NOVEMBER 17/24, 2008

■ NEWS DIGEST

6 AMD releases its second Opteron **quad-core** processor. | **Microsoft** claims **success** on its first monthly **predictions** of how **exploitable** its software flaws would be.

8 IT execs cite **ethics and morals** as the **top qualities** for new **tech workers.** | A **laid-off sysadmin** is arrested for **threatening** to damage a financial services firm's **servers.**

10 Cray's **XT Jaguar** may pass IBM's **Roadrunner** to become the world's **fastest supercomputer.**

■ NEWS ANALYSIS

12 NASA Research Finds Way Into IT, Consumer Products. Technologies developed by the space agency are being used in products ranging from computer chips to aircraft tracking systems.

18 IT Economy Goes Further Off the Rails. The bad economic news continues, with Intel cutting its Q4 revenue forecast and Sun planning to cut up to 18% of its workers.

■ OPINION

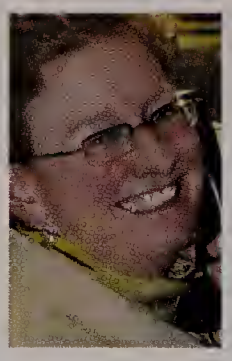
4 Editor's Note: Don Tennant responds to critics who said last week's column about continuing racism in the IT profession was a self-serving bid for more readership.

24 Scot Finnie thinks Macs are going to start showing up in more and more enterprises, even if that's not the intention of either Apple or the user companies.

43 Bart Perkins says if you're considering consulting, make sure you cast your lot with the type of firm that's right for you.

48 Frankly Speaking: Frank Hayes warns that the next generation of Web browsers is going to require a significant technology refresh at any company that hosts Web sites.

■ DEPARTMENTS



20 The Grill: MIT's **JoAnne Yates** talks about information overload, the stress of "always being on," and "CrackBerry" addicts hiding out in the bathroom.

34 QuickStudy: Identity-based Encryption. IBE solves many of the problems of public-key cryptography, since anyone can receive and decode an encrypted message.

40 Security Manager's Journal: Progress at Last, and a New Priority. As a corporate policy on patching becomes imminent, J.F. Rice decides that it's time to focus on the budget.

42 Q&A: The CIO as Innovation Czar. Harvard Business School's James I. Cash explains how some of the best CIOs are taking on innovation and enterprise integration roles.

44 Career Watch: Workers are increasingly possessed by an e-mail demon; and a management consultant speaks to Gens X and Y in their own language as he satirizes other career gurus.

46 Shark Tank: User learns that she must choose between staying connected to the network and having a color-coordinated wall jack.

■ ALSO IN THIS ISSUE

Letters 5
Company Index 46

■ FEATURES

26 Erasing Your Tracks
COVER STORY: Is it possible for an ordinary person to get an unsavory tidbit or career-threatening smear expunged from the Web? We gave ourselves a week to find out.

36 Innovation On the Skids
The U.S. is in a decade-long decline in global technological competitiveness. Central among the many reasons: our retreat from long-term basic research in science and technology, coupled with a surge in R&D in countries such as China.

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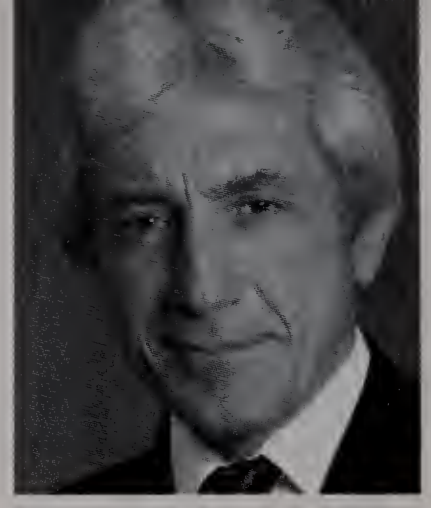
EDITOR'S NOTE

Don Tennant

Acceptance And Denial



WHEN I wrote last week about the inequities confronting African-Americans in the IT workforce and cited the election of our first African-American president as a bright sign of hope for the future, I knew full well what was in store. There would be many readers who would challenge the notion that skin color is still an issue in a country that has matured enough to elect a black president.

Reader comments about that column and a related blog post tended to dismiss the idea that race still matters; they claim it's an anachronism perpetuated by the self-serving media.

"What people should start writing about is how the USA can now drop this stigma of being a racist country and start becoming colorblind," one reader wrote. "Until the media stops using skin color to get ratings, skin color will always be a factor in what people think of others."

"We elected a black president. So what? The media are the ones making a big deal about race, not the general public," another reader chimed in. "The media are the ones dividing people by race. If everyone wants equality, we need to stop making race an issue."

"Why bring race or creed into this magazine?" asked another. "I suppose this is a sad indicator that we live in times where it is popular and will gain readership if the race card is played in some way."

The "race card" I played was reporting on continued compensation inequities as reflected in the 2008 *Computerworld* IT Salary Survey. I noted that there had been no improvement since last year, when African-Americans made up just 3% of the IT workforce, with their compensation hovering at about 14% less than that of their white counterparts.

Contending that we no longer need to acknowledge or address such inequities because we have elected an African-American to the presidency is disturbingly, dangerously myopic. Yet that's what's happening. One reader chided me for the "disconnect" in my column: "So, Americans are willing to elect an African American to the highest office in the nation," he wrote, "but you imply that African Americans fare worse in the IT workplace because of discrimination."

Many of us who have never experienced racism too easily dismiss it as an excusatory myth or a media agenda item.

The election appears to be blinding many to the fact that racism isn't only about overt, malicious discrimination. Many of us who have never experienced it find it too easy to dismiss as an excusatory myth or a media agenda item.

It's not difficult to gain the insight and understanding it takes to appreciate what's going on here. All you have to do is listen. Listen, for example, to the reader who identified himself as a black man with 24 years of IT experience.

"I am happy that a black man has become president. This nation is truly changing," he wrote. "However, look around the country and you will see by actions and words that racism still exists. . . . I really wish that it was a subject that did not still need to be discussed, but reality says it does. Let's stop trying to brush it under the rug and hope that it magically goes away."

No, we're not a nation of haters anymore, and we've proved to ourselves and to the world that we understand that a person can be black and still be worthy of election to the presidency. But we can't allow ourselves to be fooled into thinking that that understanding is equivalent to the demise of racism.

Skin color does matter. Most of us wish it didn't, but it does. If skin color didn't matter, then the bonds of trust between the races would be equivalent to the bonds of trust within each race. They are not. Until they are, there will continue to be disparities like the ones we reported with respect to IT salaries. And until they are, colorblindness will have much more to do with denial than with acceptance. ■

Don Tennant *is editorial director of* Computerworld *and* InfoWorld. *Contact him at don_tennant@computerworld.com, and visit his blog at* http://blogs.computerworld.com/tennant.

You Have to Scrawl Before You Can Type

Like Don Tennant, I am appalled by my sons' handwriting, and I find it almost painful to watch them try to write ["A Dimension Lost," Oct. 20]. Like Tennant's son, they are very smart, but put a writing instrument in their hands, and they remind you of the guys who always sat in the back row and blasted us front-row guys with spitballs — the ones who worked down at the factory before it closed.

On the other hand, my sons can both type like demons — the elder at over 80 wpm, and the younger at over 100. Perhaps there is a glimmer of good in everything.

Paul P. Myers, *application developer, Kansas Department of Transportation, Topeka*

Service Management And Client Relations

I enjoyed Don Tennant's Editor's Note regarding service management ["Of Varying Degrees," Oct. 27]. I started as a contractor at a large financial institution that brought me in because the regular help desk was very slow at executing, and it often took days to get someone to stop by and look at or fix a problem. In the meantime, these issues were slowing down the productivity of people making eight- and nine-figure deals. I am basically the face of IT for a group of around 120 people I support. They may not know the Exchange administrator, but they know me!

I was converted to full time, and now my title is "desktop support/liaison and service management specialist" — and that meshes well with Tennant's article. It really is the simplest of things to make people happy. Regular communication, updates and status reports go a long way toward reassuring people and building relationships.

Steve Thibert, *Boston*

>>> Want to comment on an article? *Write to us at letters@computerworld.com or Computerworld, Letters to the Editor, 1 Speen St., Framingham, Mass. 01701.*

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Windows 7: This Time Microsoft Gets It Right

REVIEW: In this hands-on review, Preston Gralla decides that Microsoft's upcoming OS shows great promise.

Windows Server 2008 R2

PREVIEW: There are many useful changes, Jonathan Hassell says, but the kernel-level enhancements make testing more critical.

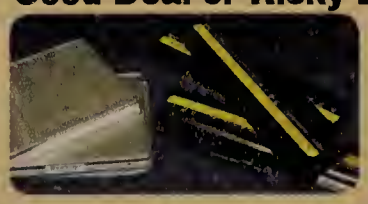
Control Those Tiny Ringing PCs

OPINION: Smart phones are miniature PCs connected to your network. Shouldn't you start to exercise some real control over them? asks Michael Gartenberg.

Twitter for Business: Tap the Power of the Tweet

Much more than a way to tell friends what you're doing, Twitter can be a valuable business tool – if you know what you're doing. Here's how to juice it for all it's worth.

Cheap Laptop Batteries: Good Deal or Risky Business?



In our tests, aftermarket notebook cells ran just like the originals but cost much less money. If a deal sounds too good to be true, though, it probably is.

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News Digest

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THE WEEKS AHEAD

NOV. 18: General sessions begin at the SC08 supercomputing conference in Austin, following three days of tutorials.

NOV. 19: The U.S. Census Bureau is scheduled to issue its report on third-quarter e-commerce sales.

NOV. 20: Hewlett-Packard is due to report its Q4 results.

NOV. 25: The PCI Security Standards Council holds a webinar on Version 1.2 of its payment-card data security rules.

PROCESSORS

AMD Hopes Shanghai Quiets Barcelona Critics

ADVANCED MICRO Devices Inc. last week released its next-generation Opteron quad-core processor, code-named Shanghai, ahead of schedule as it moves to divert attention from its ill-fated Barcelona chip.

The early release of the chip — which AMD had initially planned to ship in 2009 — comes about a year after the company was forced to delay shipments of the quad-core Barcelona for six months because of a bug in its Translation Lookaside Buffer.

AMD said that at 2.7 GHz, the new Opteron chip offers better performance than Barcelona, which has a top speed of 2.3 GHz. The new chip also has 6MB of Level 3 cache, compared with 2MB in Barcelona, the company added.

The new 45-nanometer Opteron chip received a quick endorsement from IBM, which unveiled four Shanghai-based blade and rack-mounted servers designed to run high-performance applications and virtualization environments.

IBM said one system is available now and the others will ship by early next year.

Brent Kerby, a senior product manager at AMD, said the new chip offers strong support of virtualization. Compared with Barcelona, the Shanghai CPU takes 25% less time to shift control from one virtual machine to another, he said. Therefore, "the processor can spend more time processing the virtualized application than switching," Kerby added.

The chip also uses about 35% less power than Barcelona when it's idle, AMD said.

Martin Reynolds, an analyst at Gartner Inc., said Shanghai is a nice addition to AMD's quad-core lineup and a promising competitor to Intel chips, but it's unlikely to turn the company's business around.

Shanghai "keeps the light burning for the next round of products — it's more of a maintenance product," Reynolds added.

Next up for AMD will be its six-core chip, code-named Istanbul, which is set for release late next year.

Jim McGregor, an analyst at In-Stat, called the early shipments of Shanghai "critical for AMD. They're rebuilding credibility [and becoming] more competitive at a critical time."

— Patrick Thibodeau with Sharon Gaudin

SECURITY

Microsoft: First Exploit Ratings Show Success

Microsoft Corp. last week called its first crack at predicting whether hackers would create exploit code for its software flaws a success – even though its forecasts were less than 50% accurate.

"I think we did really well," said Mike Reavey, group manager at the Microsoft Security Research Center. The vendor, which introduced its three-level Exploitability Index as part of its October patch release, predicted that consistent exploit code was likely to be created for nine flaws; code was actually crafted for four of them, Reavey said.

■ Microsoft promotes the Exploitability Index as information IT managers can use to decide which fixes to install right away.

In addition, Microsoft correctly forecast that functioning exploits were unlikely for four other flaws.

That left it with a score of eight for 20. But Reavey said the key is that Microsoft didn't rate any flaws lower than they should have been, "because then customers would have inaccurate information for prioritizing patches."

– GREGG KEIZER

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MANAGEMENT

IT Execs Put Ethics, Morals At Top of Hiring Checklists

INFORMATION technology leaders are hungry to recruit .Net programmers, desktop support technicians and voice-over-IP project leaders, according to an online survey conducted in June by the Society for Information Management.

But when asked by SIM to cite the top workplace skills that they're seeking in candidates for both entry-level and midlevel IT jobs, the 300-plus respondents placed the greatest emphasis on ethics and morals.

SIM didn't disclose the number of respondents who cited ethics and morals. But that choice overwhelmingly topped alternatives such as communication skills and business acumen, said the group, which released the full results of the annual survey at its SIMposium 2008 conference in Lake Buena Vista, Fla., last week.

Jerry Luftman, a professor at Stevens Institute of Technology and SIM's vice president of academic affairs, said that many IT executives have voiced concerns about reports of tech workers doing unethical things such as circumventing security systems (see related story below).

"To me, this is the price of entry into my [IT] department.

PAUL MAJOR, CIO AT THE ASPEN SKIING CO., ON THE IMPORTANCE OF ETHICS AND MORALS

Luftman, who is executive director of the information systems graduate programs at Stevens, also noted that cheating scandals at some U.S. colleges have grabbed people's attention.

"It's hot on everyone's minds," Luftman said. "This whole issue of ethics and morals is becoming paramount to IT executives."

"To me, this is the price of entry into my [IT] department," said Paul Major, CIO at The Aspen Skiing Co. in Colorado. Major noted that he recently had to fire two people from his 20-person IT organization because they didn't "exhibit the type of principles that we try to emulate with our team and in our company."

Major also said that prior to getting into any discussions about technical skills during job interviews, he does a "gut check" of the applicants based on how they're dressed and how they present themselves. "Then I give them the spiel on the company's guiding principles," he said.

Mike Close, chief technology officer at The Dannon Co. in White Plains, N.Y., said that gauging the moral fiber of job applicants has long been part of the vetting process at the yogurt maker, which has done "a significant amount of hiring" over the past couple of years.

— Thomas Hoffman

Short Takes

Sun Microsystems Inc. plans to lay off up to 6,000 employees as part of a restructuring aimed at saving $800 million annually (see related story, page 18). In addition, top software executive Rich Green is leaving amid a realignment of his operation.

A former **San Jose** network administrator faces 12 years in prison after pleading guilty to hacking, identity theft, burglary and drug charges. Officials said Andrew Madrid used his IT skills to commit crimes between 2006 and 2008.

Having already eliminated 2,100 positions this year, **Nortel Networks Corp.** said it plans to cut another 1,300 jobs. The company recently reported a $3.4 billion third-quarter loss.

Cisco Systems Inc. introduced the Aggregation Services Router 9000 to handle the onslaught of data coming in what it calls the "Zettabyte Era." The router, priced from $80,000, offers up to 6.4Tbit/sec. of total throughput.

SECURITY

Laid-Off Sysadmin Arrested For Threats to Harm Servers

A systems administrator who was laid off this month by a New York-based financial services firm was arrested in New Jersey last week for allegedly threatening to damage the company's servers if it didn't increase his severance pay.

Viktor Savtyrev, a 29-year-old New Jersey resident, also demanded extended medical coverage and "excellent" job references in e-mails and phone calls to officials at the firm, federal prosecutors said. They declined to identify the firm, but Third Avenue Management LLC confirmed that it is the company involved in the case.

Assistant U.S. Attorney Erez Liebermann said the arrest should "send a message to other companies that extra vigilance is important right now" because of the increase in layoffs being driven by the rocky economy.

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Savtyrev, who faces cyber-extortion charges, didn't enter a plea at a bail hearing last Thursday. But Robert Stahl, an attorney at law firm Stahl Farella LLC, said Savtyrev will plead not guilty.

The sysadmin "had no ability or intention to carry out anything," Stahl said. "You have someone who got laid off and was under a great deal of financial and emotional stress."

A spokeswoman for Third Avenue Management said that Savtyrev worked there for five years. He was let go on Nov. 5 along with nine other employees. The next day, he allegedly sent his first threatening e-mail to four workers at the company.

– SHARON GAUDIN

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SUPERCOMPUTING

With $100M Upgrade, Jaguar Set to Lead Top500

The new 1.64-petaflop Cray XT Jaguar features more than 180,000 processing cores, each with 2GB of local memory.

AFTER a $100 million upgrade, Cray Inc.'s XT Jaguar supercomputer this week may displace IBM's Roadrunner as the fastest computer in the world.

The U.S. Department of Energy announced last week that the XT Jaguar, housed at its Oak Ridge National Laboratory in Oak Ridge, Tenn., has hit a peak performance of 1.64 petaflops, or more than a quadrillion mathematical calculations per second.

Roadrunner had moved to the head of the Top500 list last summer after hitting a sustained speed of 1.026 petaflops last June, becoming the first machine to break the petaflop barrier.

The latest Top500 list, compiled by supercomputer experts throughout the world, is set to be unveiled this week at the Supercomputing Conference in Austin.

Jack Dongarra, a co-creator of the list and a distinguished computer science professor at the University of Tennessee, said that IBM's hybrid supercomputer has been updated since June, but he would not disclose Roadrunner's latest numbers. IBM declined to discuss the computer's performance.

Steve Scott, chief technology officer at Seattle-based Cray, said the Linux-based XT Jaguar now has 362TB of memory and a 10-petabyte file system.

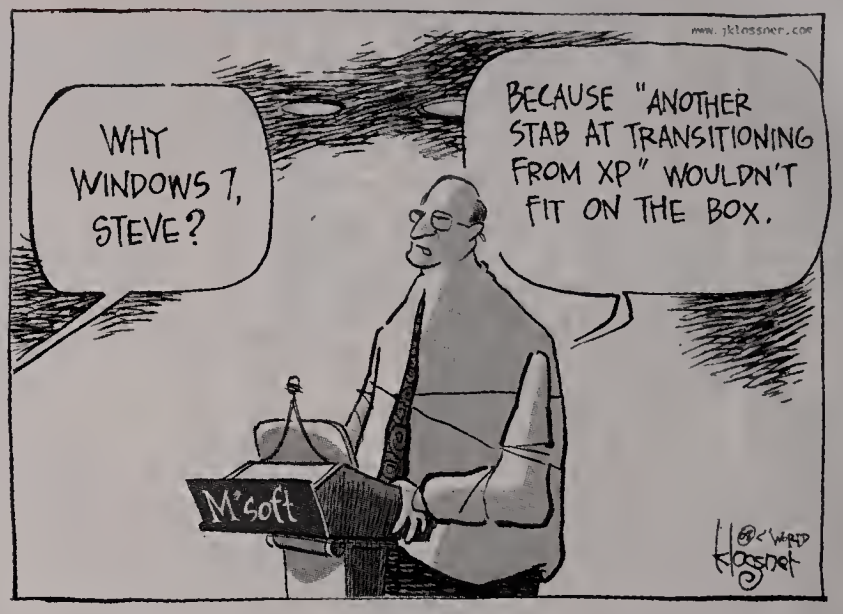
The system consists of 284 cabinets, each of which can hold up to 192 quad-core Opteron chips from Advanced Micro Devices Inc.

Buddy Bland, project director for the National Leadership Computing Facility at Oak Ridge, said the upgraded system takes up about 5,700 square feet and has 6,000 miles of interconnect cables linking the processors.

— Sharon Gaudin

BETWEEN THE LINES

By John Klossner



BENCHMARKS LAST WEEK

Microsoft Corp. patched a security hole in its Server Message Block protocol that was first reported in 2001. The vendor said it only recently found a fix that wouldn't break applications.

Spam volumes fell by more than 40% after ISPs cut off a hosting company named **McColo Corp.** from the Web. But the reprieve is expected to be short-lived.

Intel Corp. released its Penryn processors, a high-end line of Xeon and Core 2 chips that were the first products built by the company using a 45-nanometer process.

Global Dispatches

BT Group Cutting 10,000 Jobs

LONDON – BT Group PLC last week said it is laying off 10,000 people as part of an effort to improve the profitability of its services business.

The telecommunications operator said that 4,000 jobs have already been cut and that the remaining 6,000 workers will be let go by March 31.

In its latest quarter, BT reported that its revenue rose 4% to £5.3 billion ($7.8 billion U.S.), while its profit declined 1% to £744 million ($1.1 billion).

Increased costs hurt BT's Global Services business, whose profits declined 8% to £611 million ($903 million) during the period. The unit's sales came in at £2.1 billion ($3.1 billion), up from £1.9 billion ($2.8 billion) a year earlier.

Jeremy Kirk,
IDG News Service

Nasscom Expects Hiring Slowdown

NEW DELHI – India's National Association of Software and Service Companies has slashed its job growth projections for the country's IT services and call center industry for the Indian government's fiscal year, which ends March 31.

Nasscom Chairman Ganesh Natarajan last week said that in light of the global economic crisis, the group now expects the industry to hire about 200,000 people during the period, down significantly from its previous projection of 276,000.

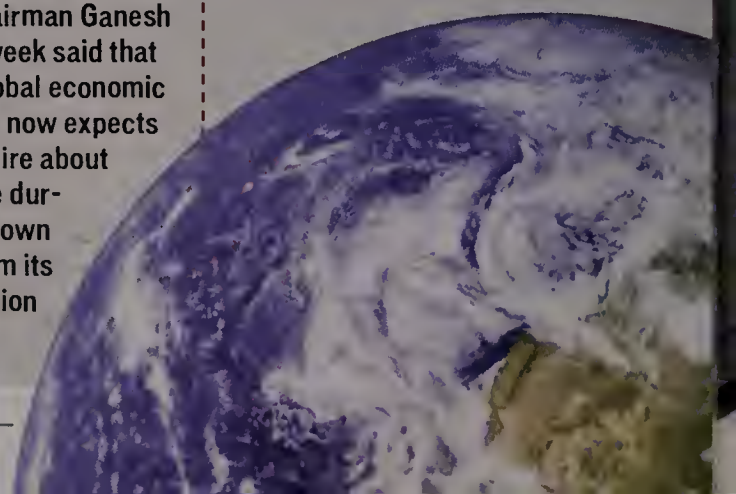
Nasscom plans to review its projections next month.

John Ribeiro,
IDG News Service

BRIEFLY NOTED

Looking to offset a shortage of researchers in India, IBM's India Research Laboratory this month unveiled an initiative called the Blue Scholar Program. The program is intended to provide internships to encourage Indian computer science graduates to take up research as a career.

John Ribeiro,
IDG News Service



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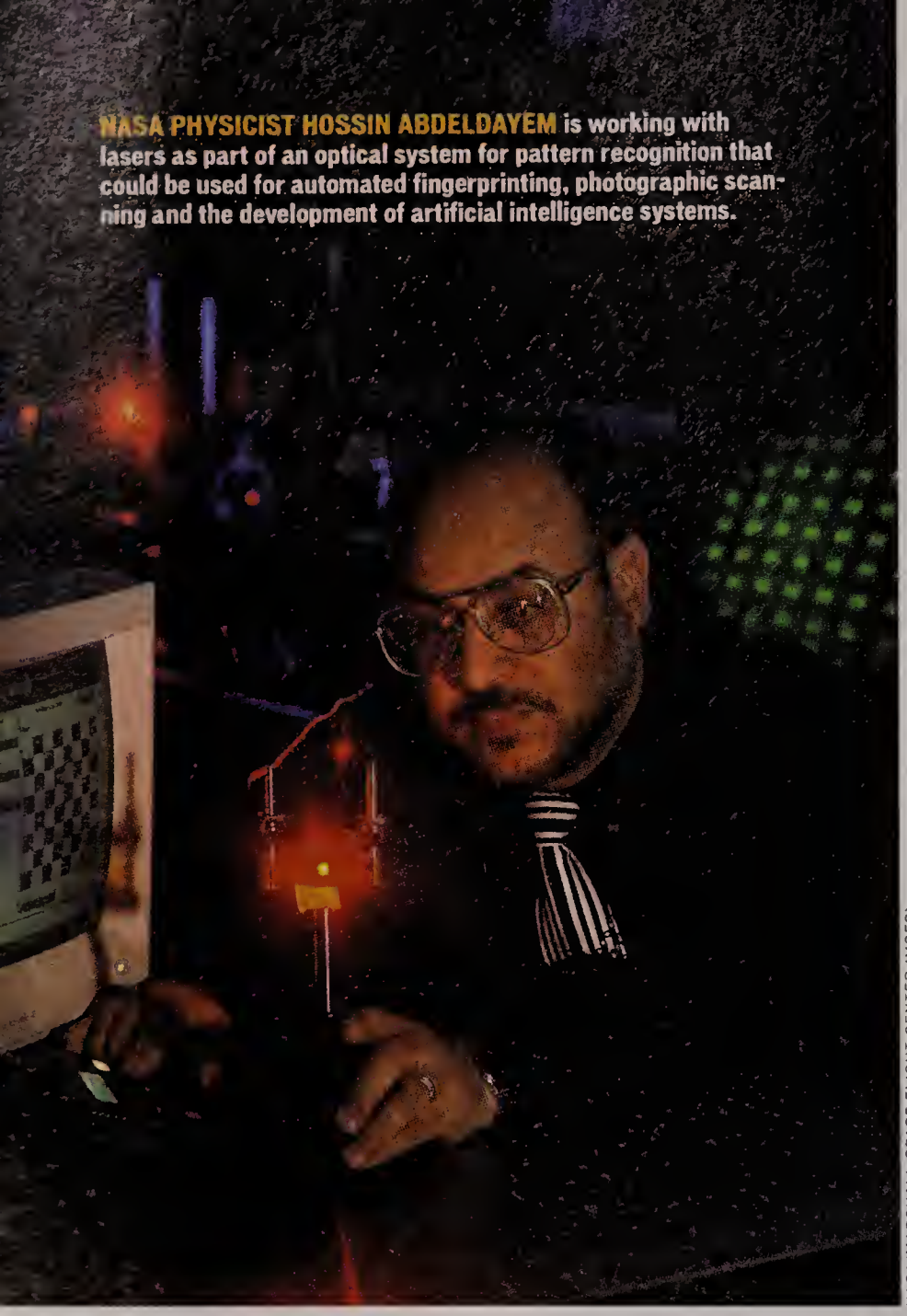

NASA PHYSICIST HOSSIN ABDELDAYEM is working with lasers as part of an optical system for pattern recognition that could be used for automated fingerprinting, photographic scanning and the development of artificial intelligence systems.

NASA/MARSHALL SPACE FLIGHT CENTER (MSFC)

■ NEWS ANALYSIS

NASA Research Finds Way Into IT, Consumer Products

Fifty years of technology helped to create Silicon Valley and improve health care.

By Sharon Gaudin

AWARE of a history of heart disease in his family, then-50-year-old Gary F. Thompson saw his doctor for a checkup before he ran a Los Angeles marathon in the mid-1990s.

His doctor gave him the go-ahead to run the race, but Thompson, who had been an active athlete his whole life, had a heart attack at mile 20. The attack damaged 48% of his heart muscle.

Thompson said that the devices used to test his heart lacked the ability to determine the true risk he faced in running the marathon.

After recovering from the trauma, Thompson created a company that used technology developed by the National Aeronautics and Space Administration to create a device that can more accurately judge heart health.

Some may say that NASA is an odd place to find a way to build better cardiac care equipment, but the idea isn't really that far-fetched.

Technology developed by NASA scientists routinely makes its way into products developed in the robotics, computer hardware and software, nanotechnology, aeronautics, transportation and health care industries.

Scott Hubbard, who worked at NASA for 20 years before joining the faculty at Stanford University, where he is a professor in the aeronautics and astronautics department, said that NASA research has had a significant impact on the IT industry over the past 40-plus years.

"The integrated circuit and [the emergence of] Silicon Valley were very closely linked with NASA," Hubbard said. For example, he noted that hardware pioneer Silicon Graphics Inc. got off the ground with the help of investments from NASA.

Hubbard also pointed out that NASA engineers have worked "hand-in-hand" with businesses and universities to help develop a variety of technologies, including microelectromechanical systems, supercomputers and microcomputers, software and microprocessors.

Overall, Hubbard added, $7 or $8 in goods and services are produced for every $1 that the government invests in NASA.

The benefits of NASA research are clear, even without the embellishment of myths. For example, the space agency did not invent the powdered beverage Tang, and its engineers did not develop the microwave oven.

After suffering the heart attack, Thompson founded Medical Technologies International Inc. and licensed NASA's Video Imaging Communication and Retrieval software for use as the centerpiece of a new cardiac imaging system.

The software had been developed just a few years earlier by scientists at NASA's Jet Propulsion Laboratory in Pasadena, Calif., to process images from space missions such as the Mars Reconnaissance Orbiter and the Voyager spacecraft.

The NASA software is a key piece of Palm Desert, Calif.-based Medical Technologies' ArterioVision medical device, which is designed to help doctors detect hardening of the arteries before it can cause a heart attack or stroke.

The technology is now used at several major hospitals, including the University of Chicago Medical Center and Cedars-Sinai Medical Center in Los Angeles, Thompson said.

"Private industry has developed a lot of great things, but what comes out of our space program is a cut above what private industry could do," said Thompson. "Private industry wouldn't be as patient as NASA is in developing technology. [Industry] has Wall Street demands and stockholders, so it's hard to put the time and money into something that won't have a quick return on investment." [However, some observers say that even the government is looking for a quick ROI on its R&D. See page 36.]

And NASA can attract the

Continued on page 16

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Continued from page 12

best and brightest scientists and engineers by offering them the chance to, say, remotely repair computer systems on spacecraft orbiting the Earth at 17,500 mph or work on projects like building rovers to traverse and study Mars.

Technologies invented at the space agency are likely to make their way into IT and consumer products because of congressional requirements set more than 40 years ago that require NASA to keep track of how its inventions are used outside of government.

In 1976, NASA launched its annual *Spinoff* publication, which reports on the use of NASA technologies in the private sector.

"We explore the universe to expand human knowledge," said Daniel Lockney, editor of *Spinoff*. "But in addition to knowing more about black holes, we have these secondary benefits."

For instance, NASA's efforts to find a highly nutritional food crop that could be grown on manned missions in space led to the discovery of a strain of algae that contains the same nutrients as those found in human breast milk. Martek Biosciences Corp. in Columbia, Md., took advantage of that research to develop nutrients that are now added to more than 90% of infant formula products, Lockney said.

Research by NASA scientists can also be linked to the development of freeze-dried food, scratch-resistant sunglasses, bicycle helmets, lithium polymer batteries and other consumer products.

In addition, NASA-developed laser technology is used in photo scanning and fingerprinting systems and in the development of artificial intelligence technologies. NASA also played a key role in developing the integrated circuit, which fueled the birth of Silicon Valley and firms such as Intel Corp. and Advanced Micro Devices Inc.

Even a spray developed at the Kennedy Space Center to prevent saltwater from corroding its concrete buildings along the Florida coastline was used by scientists at Surtreat International LLC to create commercial products that protect buildings, bridges and roadways, said Lockney.

"I don't think people realize that a lot of technologies that we use in our everyday lives have been developed around or for spaceflight," said Jim McGregor, an analyst at In-Stat in Scottsdale, Ariz.

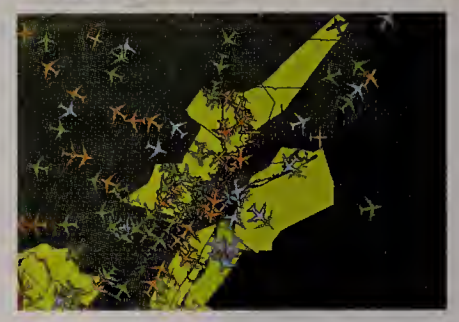
"NASA really has developed some of the most critical technologies that have changed our lives. Their research leads to future spaceflight, but also technology that benefits the U.S. and several industries," McGregor added.

In 2006, Flight Explorer Inc. licensed NASA's Future Air Traffic Management Concepts Evaluation Tool, which was developed at NASA's Ames Research Center, to use in its aircraft-tracking and communications systems.

Chris Zanardi, director of solutions management for Sabre Flight Explorer, said the technology at one time was used by 85% of U.S. airlines, but it has since been replaced by a simpler tool that the McLean Va.-based company developed internally. The NASA software worked well, he said, but required significant training of clients — more than his company could feasibly provide.

"It's one of those things where it's not paste and overlay. It required some training, and everybody has resource constraints," said Zanardi.

PHOTOS COURTESY OF NASA



In 2006, Flight Explorer licensed NASA's Future Air Traffic Management Concepts Evaluation Tool (left), which was developed at NASA's Ames Research Center (above), and used it for a time in its Sabre aircraft-tracking and communications systems.

Nonetheless, he said that Flight Explorer would be eager to use another NASA technology because the agency is "at the forefront of providing R&D [for] air traffic management tools. We want to partner with [entities] like NASA that help us help our customers."

American Science and Engineering Inc. said its work for NASA in the 1960s and 1970s created the basis of its business today.

Rich Mastronardi, vice president of business development at AS&E, explained that the company was founded in 1958 to develop scientific instruments and applications for NASA. The company's first team of scientists were pioneers in the field of X-ray astronomy, which is the study of celestial bodies through the X-rays they emit.

NASA has since licensed the technology to a variety of vendors that have used it to create digital X-ray systems for hospitals, advanced weather-prediction technology, and NASA's orbiting Chandra X-ray Observatory Center for X-ray astronomy.

AS&E has taken advantage of this research to build security X-ray systems that are used at ports, borders and military facilities to detect threats such as explosives.

"I think that a lot of the early work that was funded by the government really did break barriers and opened up opportunities for all kinds of products," said Mastronardi.

"If it was left to commercial ventures, it would be a much more shortsighted approach to technology. If you're a company, you need to have a return on investment, and it reduces your ability to invest in far-reaching technologies that may not have an impact for years," he added.

Mastronardi noted that the company's focused research has led to a diverse range of applications decades later. Without NASA research, AS&E "probably wouldn't exist or [it would] certainly be a different company," he added. "It gave us the platform to develop all kinds of applications for X-rays." ■

Where is the keyboard? Don't all BlackBerrys have keyboards? This just has a screen that looks like a keyboard and–oh sweet sassafras, did it just click? It clicked right where I wanted it to. Is that supposed to happen? And is it supposed to feel so good?

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NEWS ANALYSIS

IT Economy Goes Further Off the Rails

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A grim week: Intel cuts its sales forecast, Sun plans big layoffs, and IDC lowers its IT spending projections. **By Matt Hamblen, Thomas Hoffman and Patrick Thibodeau**

THE DRUMBEAT of economic bad news grew louder in the IT industry last week, as Intel Corp. reduced its fourth-quarter revenue forecast by as much as 20% and Sun Microsystems Inc. announced plans to lay off up to 18% of its workforce.

Even India is feeling the economic wallop: The country's largest technology trade group cut its IT services hiring projections (see Global Dispatches, page 10).

Meanwhile, market research firm IDC lowered its IT spending forecast for 2009, saying it now expects worldwide spending to grow by just 2.6% over this year's level — less than half its earlier 5.9% prediction. IDC forecast that in the U.S., spending will grow a minuscule 0.9% next year.

Gartner Inc. similarly reduced its spending outlook last month, projecting 2.3% growth globally in 2009.

The more pessimistic forecasts were reinforced by survey results released last week by technology reseller CDW Corp. CDW, which commissions a bimonthly survey of IT decision-makers by an outside polling firm, said that in the latest survey, managing operational costs was the most-cited priority for next year.

Forty-one percent of the 1,058 respondents included cost management among their priorities. In comparison, 35% cited increasing their companies' market share and improving customer satisfaction, while 33% said that making technology improvements was a priority. The survey was conducted from Sept. 15 to 22, a time when the economic situation was just starting to go from bad to worse.

Prior to the Society for Information Management's annual member conference last week, Jerry Luftman, a professor at Stevens Institute of Technology and vice president of academic affairs at SIM, said that IT executives have been more proactive about reining in spending than they were during the dot-com bust and post-9/11 downturn.

That's reflected in the results of an online survey SIM conducted in June that had more than 300 respondents from 231 organizations. Among the findings: Respondents said they expected the average percentage of their IT budgets devoted to offshore work to increase from 3.3% this year to 5.6% in 2009.

However, only 15% of the respondents said they expected to reduce their IT head counts next year. Although the survey was conducted before the downturn accelerated, Luftman said he doesn't anticipate a big increase in the number of job cuts.

On the other hand, adding workers may not be in the cards either. For example, The Dannon Co. is looking to "retool" some IT staffers with new skills in areas such as sales or research and development in order to avoid head count increases, CIO E. Jeffrey Hutchinson said.

"What we need are not the technical skills — I can outsource those to other countries around the world," Hutchinson said. "We need the individual who has the breadth and depth of expertise [and] can be perceived by the functional or process areas as a value-add."

Various IT vendors are feeling the economic pinch. Companies such as SAP AG and Sun had already reported lower-than-expected financial results and warned of uncertain times ahead before Intel joined them last week, saying it is seeing "significantly" reduced demand.

The chip maker now expects its Q4 revenue to total between $8.7 billion and $9.3 billion — down from a previous forecast of $10.1 billion to $10.9 billion.

And on Friday, Sun said it will cut 5,000 to 6,000 jobs over the next 12 months.

Things could get worse if any, or all, of the Big Three U.S. automakers are forced into bankruptcy or out of business. That's possible if the government doesn't throw them a financial lifeline.

For now, the automakers are still buying IT products, said Kelly Thomas, an executive at supply chain software vendor i2 Technologies Inc. But, he added, they're putting off multiyear projects and have become reluctant to sign long-term contracts — an ominous sign for such a key industry. ■

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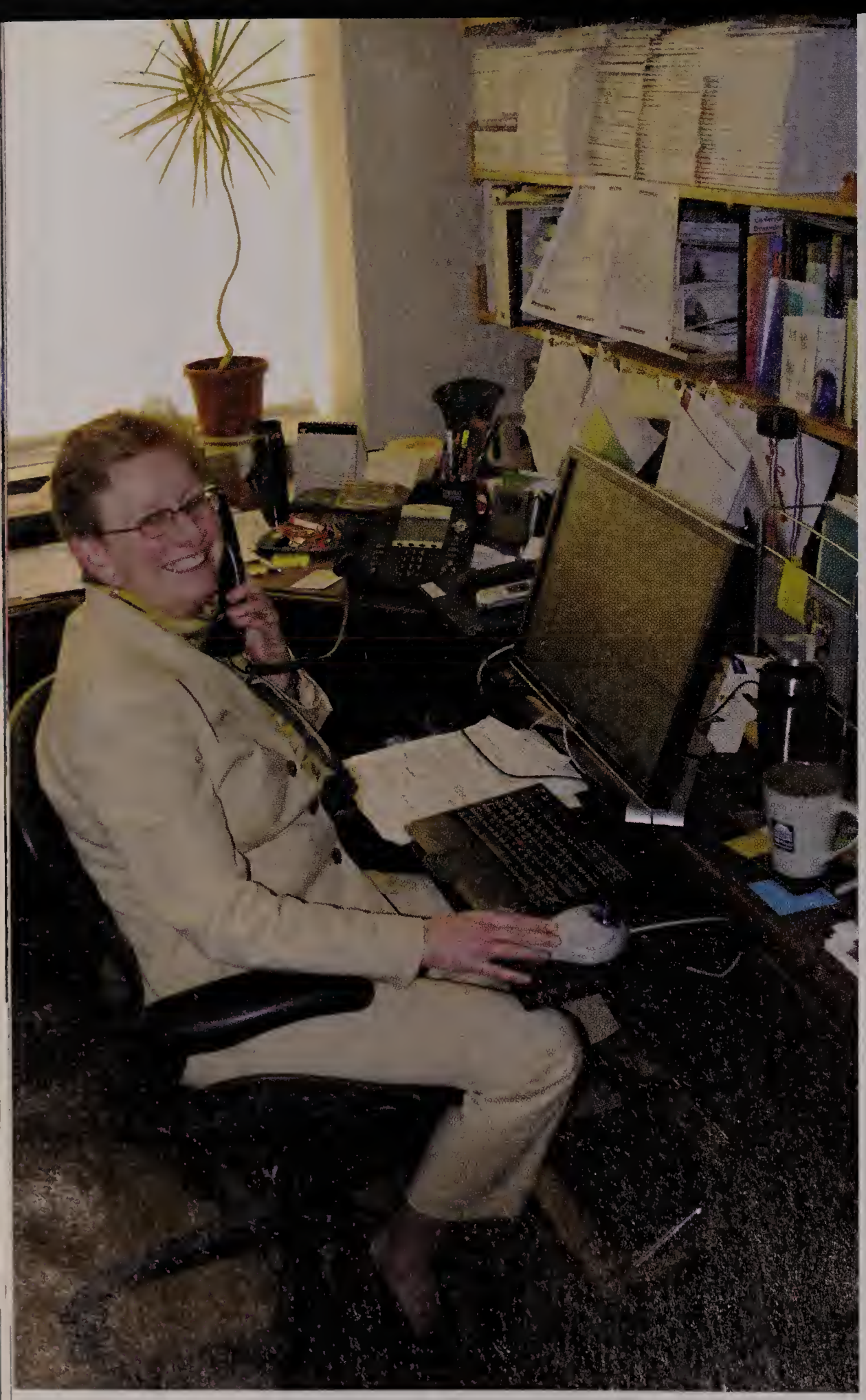

THE GRILL

JoAnne Yates

MIT Sloan's JoAnne Yates talks about **information overload,** the stress of **'always being on'** and **'CrackBerry' addicts** hiding out in the bathroom.

Dossier

Name: JoAnne Yates

Title: Deputy dean and Sloan Distinguished Professor of Management

Organization: MIT Sloan School of Management

Location: Cambridge, Mass.

Something people don't know about her: "I have a large collection of rubber ducks, ranging in size from a half inch to over two feet in length."

Favorite vice: "A glass of wine when I get home at the end of the day."

Ask her to do anything but: "Travel internationally for work."

Pet peeve: "Multiple layers of responses to responses interspersed throughout an e-mail."

Favorite book of all time: *Persuasion*, by Jane Austen

MIT Deputy Dean JoAnne Yates is co-author of an upcoming article on information overload called "Ubiquitous E-mail: Individual Experiences and Organizational Consequences of BlackBerry Use."

Is there much academic research on the issue of information overload? A doctoral student at MIT Sloan, Melissa Mazmanian, has done research on this, not yet published. She is working on a co-authored article with Wanda Orlikowski, a professor of IT at Sloan, and me on the use of BlackBerry devices by about 30 workers in one financial services firm. The BlackBerry tends to be seen by them as a way of reducing stress in the present because it is better to get alerts on a BlackBerry than to come back to a computer later and find there's a disaster.

But the other side is the unintended side effect of putting more stress on them in the longer term, because they have so little downtime. They all complained about how they are never away from it. So, while they loved their BlackBerries, they paid a price in long-term stress.

Continued on page 22

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"If you are on a team of workers, you have to set expectations about response times, but most of the time, those expectations go unarticulated.

Continued from page 20

Have you seen any thoughtful responses to this problem? Sometimes blogging and IM have been forbidden by managers, or companies are hesitant to use such approaches. Some organizations adopt wikis so everyone sees everything going on, but that's actually a very hard transition to make properly. That approach requires changes in behaviors in the entire team, but people don't always take the time for training or know what is expected of them.

Wanda Orlikowski's research shows there is a strong social component to all of this. Communications norms matter, not just the technology and software tools side and not just the individual cognitive side.

How do you change group norms to deal with information overload? If you are on a team of workers, you have to set expectations about response times, but most of the time, those expectations go unarticulated. Everybody has a general sense of what's expected, but to change something, you have to raise expectations to an explicit level and you have to consider whether they can or should be changed. You cannot deal with the issue until you make it explicit; otherwise, you get this spiral of expectations that is happening implicitly, which leads some to this feeling of "always being on."

Within your workgroup, you need to decide, "Do we want to use this method to communicate, or do we not want to take it on?"

Do you have any specific examples? If you have a team of people, e-mail seems to be the universal default. So if you add wikis, or blogs or social networking, then different people will want different technologies. You wouldn't want everybody to go to every possible medium; you do have to have some kind of agreement on what will be the default line of communication.

On an individual level, you need to reach an agreement on what you are going to commit to checking in on. If you use a wiki for project communications, you might want to say that members check that wiki twice a day, or with e-mail, that everyone checks in once each morning.

These ideas sound good for collegial teams, but what about in hierarchies, where there's a boss in charge? Younger workers have to learn what the bosses want, and that's a reality of the workplace. The boss needs to make procedures explicit, such as, "I expect you to check e-mail once a day by *x* time and respond to anything I send you." But that's not always done when new people come aboard.

If you are a boss, you can ask a worker to report to you in a certain way too. I know someone who got e-mails from a subordinate every 15 minutes. The manager finally told the worker, "Look, I can't work with this stream of little questions coming in. When you really know what your question is, write me a single e-mail." By being explicit, it got easier to manage.

Is information overload hurting organizations? I can't give examples of where it is hurting the bottom line, but I know of many examples where it hurts individuals. We interviewed spouses of the workers at the financial services firm, and some of their comments were amazing. A lot of them really hated their spouses' use of the BlackBerry. It does cause a lot of tension. We also found that several of those workers were answering their BlackBerries in the bathroom, hiding it from the spouse where they would not be seen.

So, are organizations not doing enough to address the way the staff typically handles information? Our society's cut on this problem, reflected in the term "CrackBerry" and related addiction rhetoric, is that the problem happens at an individual level, which ignores the social problem. In general, organizations keep waiting for technology to solve the information overload problem, but if every worker makes individual decisions on how to solve the overload problem, you are fragmenting the communications world even more. Technology is part of the solution, but only a part. It's also how we use the technology, on an individual and a social level.

Do you have any personal tricks? For me, my mental discipline each day is that I never leave my computer at night until I have e-mail down to one screen of e-mail in my in-box. That happens to be what works for me. But sometimes I end up answering the lower-priority items just to get them out of there. Also, I don't like long periods on the phone, so I push people into the e-mail stream.

Still, others prefer the other ways. Some people answer e-mail one hour in the morning and one hour in the afternoon only, and that might work for some at MIT who are academics and are researching and teaching.

— *Interview by* **Matt Hamblen**

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OPINION

Scot Finnie

Apple's Stealth Business Notebook

MANY OBSERVERS consider the iPhone to be Apple's Trojan horse for the enterprise market. And with good reason. Figures just out show that Apple sold more than 10 million iPhones during its first 15 months. With or without IT approval, a whole lot of Apple smart phones are being used in business.

That's why I paid close attention to the MacBook and MacBook Pro models released by Apple last month. I was surprised by the new MacBook's specs. My surprise turned to admiration a couple of days later when a new MacBook arrived on my desk.

The previous-generation MacBook was thick and heavy. Its chief claim to fame was that it was Apple's least-expensive notebook and biggest seller. The sweet spot of the lineup was the $1,299 model, which had a 2.4-GHz processor, 800-MHz front-side bus, 2GB of RAM and a 160GB hard drive.

The new $1,299 MacBook has a durable aluminum unibody case, a bright LED-backlit display, the new glass touch-interface trackpad, a 1,066-MHz front-side bus, 2GB of RAM, and integrated 256MB Nvidia video. It's also smaller than its predecessors at under an inch thick, and lighter at 4.5 lb. The processor speed for this model is back to 2 GHz. The new top-of-the-line MacBook, which sells for $1,599, has a 2.4-GHz Core 2 Duo processor, a 250GB hard drive, 2GB of RAM and an illuminated keyboard. Apple's price for an upgrade to 4GB of RAM is a reasonable $150.

The specs don't really tell the story, though. Consumerization is now a powerful driver in corporate adoption of end-user technology. I'm not predicting wholesale adoption of Macs by enterprises anytime soon, but the new MacBook will make more significant inroads into that market than any Apple product, probably ever. It comes down to price/performance, price point, design focus, durability, suitability to task and market timing.

Consumerization is now a powerful driver in the adoption of end-user technology by enterprises.

To explore some of these aspects, I asked my company's senior manager of technology services, Kevin Ford, to do the math. He did a formal price comparison of the Lenovo X200 — a model that employees of *Computerworld* and parent company IDG are often supplied with — and the new 2.4-GHz MacBook. Both prices were quoted to Ford with enterprise discounts by a well-known third-party online vendor. The specs are comparable except for display size and overall weight (the X200 has a smaller screen and weighs 1.2 lb. less). The price difference was just $30, in favor of the MacBook at $1,566.70.

Your enterprise's mileage may vary. Perhaps your company prefers Dell, HP or Toshiba. I know you can find notebooks that cost considerably less. But there's a reason enterprise notebooks tend to cost around $1,500: It's the amount that gets them over the minimum for capital expenditure depreciation at many companies.

Like the old MacBook, the new one seems to be aimed primarily at the education and home markets. (When I asked to speak to an Apple exec about the market strategy for the new MacBook, the company declined to grant an interview for several weeks.) But unlike the old MacBook, the new one looks and feels like a business machine. And its most important advantage may be its blend of power and portability — a careful balance of the primary needs of the average business user.

In September 2007, I wrote an article about why Apple's Macs weren't fully meeting the needs of business, saying, "To build the small and light notebook that many corporate users crave, Apple should start with the MacBook Pro case and trim it for a 13.3-in. display. It doesn't have to be aluminum, but it does have to look upscale."

The new MacBook fully addresses my year-old criticisms. Apple finally has the right hardware and software for mainstream business users.

But will Apple ever figure out how to sell to enterprises? It's going to be interesting to find out. ■

Scot Finnie *is* Computerworld*'s editor in chief. Contact him at scot_finnie@computerworld.com.*

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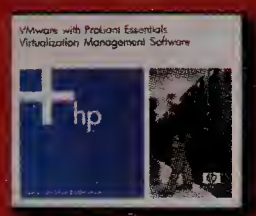

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ERASING YOUR TRACKS

Is it possible to expunge your online past? We find out.

BY TRACY MAYOR

AN UNSAVORY connection from your past. An annoying link to your name that's dragging down your career. A spicy quote you tossed off to a reporter that you wish you could take back.

As time goes by, more of us are being tailed by some little thing out there on the Web, an awful bit that emerges when someone Googles our names, a black mark that we'd like to erase before a colleague or a prospective employer sees it.

A whole industry — known as online reputation management — has grown up around helping individual clients and corporate clients suppress negative information online by creating more positive and search-engine-friendly postings.

But what if you don't just want something massaged, manipulated or suppressed? What if you want it gone? Is it possible for an ordinary person to get some damaging tidbit entirely erased from the Web?

Computerworld decided to find out. We gave ourselves a week to try to expunge unwanted online mentions, using three real-life examples as test cases:

■ **A recent college graduate with a distinctive last name would like to get rid of an entry on someone else's long-abandoned online journal.** The entry mentions her full name in a rambling tale of drug-induced debauchery and sexual high jinks. It always shows up as the fourth or fifth result in a Google search on her name — a real problem now that the young woman (let's call her WrongedGirl) is applying for jobs.

■ **A freelance writer is mistakenly identified as a movie critic on Rotten Tomatoes, a popular site that aggregates movie reviews from print, TV and the Web.** Although she personally admires Rotten Tomatoes, she worries that her byline juxtaposed next to the word "rotten" in the first few Google search results sets up an unpleasant association in the minds of prospective clients — especially older business people who have no idea what Rotten Tomatoes is.

■ **In an interview seven years ago, an IT professional gave a quote to *Computerworld***

Continued on page 30

STEPHEN WEBSTER

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Continued from page 27

that included a salty phrase. She recently contacted the editors, asking them to either remove her name from the piece or prevent the article from being found in a search. Her goal: "I don't want any hits at all when my name is searched."

We started by calling a couple of online image management professionals for some free advice.

WHAT NOT TO DO

If you're trying to get something erased from the Web, your first instinct might be to pursue legal action. Resist this urge, says Michael Fertik, CEO of ReputationDefender Inc., an online reputation management and privacy company in Redwood City, Calif.

Why? The Communications Decency Act of 1996 gives almost total immunity to Web sites. Even if you can establish a legal case, the distinctly nonphysical nature of the Web — where you, your defamer and the company that hosts the offending material can be in different states or countries, or simply be unknown — means that sorting out jurisdictions can turn into a legal quagmire.

Likewise, Fertik adds, another surprise dead end is the place where many people launch their erasure efforts: Google.

If an item doesn't show up in a Google search, it's as good as being truly gone, right?

Wrong. "Removing content from Google or another search engine would still leave the original content that exists on the Web," says a Google spokesman.

The better route, according to the spokesman: "Users that want content removed from the Internet should contact the webmaster of the page or the Internet hosting companies or ISPs hosting the content to find out their content removal policies."

Google does offer tools on its support page to help with urgent requests to prevent personal content from appearing in a search result, such as when credit card or Social Security numbers are accidentally or maliciously published on the Web. If you do manage to successfully remove such an item, you'll need to also make sure that Google no longer caches the information, the representative says.

If legal action is prohibitively complicated and Google and other search engines can't help, what's the best tactic for getting something erased? A little digital digging and a lot of good old-fashioned human contact.

THE TALKING CURE

Priority No. 1 is to try to reach a human being, says Chris Martin, founder of ReputationHawk.com, an online reputation management service. His company starts by tracking down someone who has access to the Web site in question — either the author of the material or a third party like a webmaster or Web hosting service. "If the Web host is billing that person every month, if it's a paid account, they'll be able to contact them," Martin says.

If that approach fails, his company tries to reach people through various social media sites such as MySpace or Facebook or Web portals like Yahoo.

The bottom line: An address or a live e-mail account is good; a human on the phone is better, Martin says. "We call," he says. "We say we're from an Internet privacy corporation. We explain the situation, and we say, 'You need to take care of this as soon as possible.' "

Many times, people do, he says. "The situation can resolve really quickly," Martin says. "If there's a legitimate problem, it's natural for someone to go in there and take the material down."

ReputationHawk's fees vary by case. For a situation like WrongedGirl's, the charge would be $500 or less, Martin says. ReputationDefender doesn't take on ad hoc erasure cases. Instead, clients pay $9.95 per month for a yearly subscription and $29.95 per removal.

Both services claim that they have a much higher success rate than individuals. The reason? You're a newbie; they do this all day, every day.

ReputationDefender has taken on about 1,000 cases with an 85% success rate, according to Fertik. He says the cases build upon one another as relationships develop. "If you call them informally enough times, let them know you're not an abusive company, you're not sending legal letters, then you can have a very high success rate."

In contrast, says Martin, an individual trying to clean up his own reputation starts from scratch and has almost no clout. "We can dig and find contact information pretty quickly, and we're going to have a lot more pull when contacting the Web site owner," he says.

Of our three cases, both experts said the case of WrongedGirl stood the best chance of being resolved.

That's good news, since it's the type of scenario that's playing out ever

Continued on page 32

Rotten Tomatoes: STRIKE ONE

Computerworld started with three real-life instances in which people wanted material expunged from online sites, but the experts we consulted were optimistic about only one case – the situation in which a young woman's first and last name were included in a salacious online journal entry.

Here's a look at our second case:

■ **Freelance journalist wants her name taken off the Rotten Tomatoes movie-review Web site.**

Good luck with that, say ReputationDefender CEO Michael Fertik, ReputationHawk founder Chris Martin and Columbia University journalism professor Todd Gitlin. Large, commercial (implication: lucrative) Web sites have little need to accommodate your petty requests. If you get through and find a sympathetic person on the end of a phone line, perhaps you'll get lucky. Otherwise, fuggedaboutit.

That prediction turned out to be on the money. Multiple e-mails to various Rotten Tomatoes addresses went unanswered or were bounced back as undeliverable. Messages left at the phone number for the parent company, IGN Entertainment Inc., likewise went nowhere.

Apparently, the journalist's best course of action would be to do what reputation mavens recommended in the first place: Create enough positive, search-engine-friendly content to push the "rotten + journalist's name" search result to Google's second page of results.

– TRACY MAYOR

From: I need training to install this

To: My intern installed this

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Continued from page 30

more frequently as the Net generation enters the workforce.

Armed with advice from the pros, we set out one recent Monday to see how far we could get in righting WrongedGirl's reputation in a week.

We first tried to track down the journal author herself, with the idea that we could entreat her to take down the offensive material. (Perhaps she had matured since her partying days.) It seems that five years ago, she set up an account at a free online journal site and posted half a dozen entries in 10 days — most apparently written under the influence of one substance or another — before abandoning the site.

We knew only her first name, her hometown from five years ago and the bands she liked at that time. The e-mail address listed in the user account for her online journal was defunct.

WrongedGirl provided us with a possible last name for the author, but unfortunately, like the author's first name, it was too common to be helpful. Her first and possibly last names together garnered 1,260 hits on Google, including multiple references on YouTube and multiple accounts on LinkedIn and Facebook, none of which appeared to be our author.

After a couple of mind-numbing hours trolling MySpace accounts, we did find an entry that looked promising (same first name, same state and county, if not exact hometown, and same favorite bands), but that too had been updated only a few times before being abandoned more than two years ago. It looked like we had a serial journaler on our hands.

SCOPING OUT THE SITE

We gave up on trying to track down the author and turned to the site where the journal was posted — Blurty.com. We posted our request to remove the offending material in the support forum. A few moments later, we received an automated e-mail response, with a tracking number, saying that our request had been received and would be addressed as soon as possible. But over the next four days, nobody responded.

Trying another angle, we trolled through Blurty's support, legal, privacy and terms of service documents and sent e-mails to any other addresses we found there (abuse@blurty.com, for example), asking that the entry in question be taken down.

Two days later, with no response on any front, we used WhoIs to try to find a physical address for Blurty. Its technical contact was listed as being in Encinitas, Calif. When we called the phone number given in the WhoIs listing, a recorded voice informed us we'd reached Sunlane Media LLC.

Back to the Web for more searching: Our heart sank when we found that Sunlane has registered hundreds of other domains, nearly all of which appeared to be porn sites. Wonderful.

We called three separate phone numbers we found for Sunlane in various WhoIs listings — two of which sounded like cell phones and one that had the quality of a home answering machine circa 1995. None had a live person on the other end. We left messages at each number, trying to sound professional enough to elicit a swift response and distressed enough to elicit sympathy.

RESOLUTION

The next day was Friday, our self-imposed deadline. We sent one final e-mail — replying to the webmaster address from which we'd received the tracking number earlier in the week — and requesting a response that leaned even more heavily on the sympathy angle.

Still nothing. At the end of the day, feeling discouraged, we drafted an e-mail to Fertik at ReputationDefender, requesting suggestions for further action. But when we Googled WrongedGirl's name to find and furnish the link to the offensive journal entry, it was gone from Google.

Amazed, we flipped over to the Internet Explorer bookmark we'd made for the page and saw this message: "Error. This journal has been suspended."

Excellent! But just what had done the job — which e-mail or phone call? We had no way of knowing, though a full 10 days later, an e-mail arrived from the abuse@blurty.com address, telling us what we'd already figured out: The journal had been suspended.

We were ebullient but also chastened. Yes, we had managed restore WrongedGirl's good name, but we had no clear understanding of exactly how we had done it, and our other two attempts at erasing unwanted online tracks (see related stories, above and on page 30) had come up dry.

In the end, Fertik's words came back to haunt us: "A lot of this stuff you can do yourself — if you have the time, the expertise and the temperament to get it done," he had told us before we began. "But how many people change the oil in their own car anymore?"

Of course, Fertik has a vested interest in urging people to hire companies like his own, but we had to concede that he also had a point: Erasing your tracks online takes time, perseverance and more than a little luck. ■

Mayor *is a* Computerworld *contributing editor.*

Misbegotten Quote: STRIKE TWO

Our third attempt to erase someone's digital tracks also met with defeat.

■ **IT manager talks salty to a business publication – *Computerworld* – and later regrets it. On this topic, our experts were divided. Columbia University journalism professor Todd Gitlin says it would be exceedingly rare for any mainstream publication to change the record for any reason. (*Computerworld*'s editors agreed. The quote, with the source's name attached to it, still stands.)**

ReputationDefender CEO Michael Fertik sees a little wiggle room, however. True, *The New York Times* is unlikely to change the record, but some smaller outlets might, he says.

"I don't know if I buy the journalistic integrity argument – though I respect it. A lot of small newspapers will fold right away as soon as you threaten them," he says.

That said, he notes that ReputationDefender does not handle requests to expunge material from mainstream media.

– TRACY MAYOR

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Identity-Based Encryption

IBE simplifies cryptography for message administrators, senders and receivers.

By Russell Kay

PUBLIC-KEY cryptography offers very strong protection for electronic communications. Much of its strength comes from the use of paired keys, which are separate (but mathematically related) codes that encrypt and decrypt a message; one key is public and one is known only to the recipient.

But hardly anyone uses public-key cryptography, because it's too much trouble. The recipient has to be prepared with both public and private keys, and the sender has to know or be able to find the recipient's public key. In most cases, this means that the sender must query a certificate authority to retrieve the target recipient's public key. Although this is simple within a company, senders outside the organization don't have any access to a central directory, so it's more difficult for them to send encrypted messages. Moreover, the process works only if the recipient has already decided to use it and has made a key available. And most people don't have public keys.

A SOLUTION

One promising solution to these difficulties is called identity-based cryptography or identity-based encryption (IBE). In this process, which can be initiated by the sender, a unique identifier of the recipient (such as his e-mail address) is used to calculate a public key. A trusted third-party server, called the private-key generator, uses a cryptographic algorithm to calculate the corresponding private key from the public key. In this way, recipients can generate their own private keys directly from the server as needed, and they don't have to worry about distributing their public keys.

HOW IBE WORKS

The success of IBE depends upon the third-party IBE server that generates private keys. The only information this server stores permanently is a secret master key — a large random number that is exclusive to the security domain. The server uses this key to create a common set of public-key parameters (including the server's address) that are given to each user who installs the IBE software, and recipients' private keys as required.

When a sender creates an encrypted message, the IBE software on his system uses three parameters to generate the public key for the message: a starting value, the current week number and the recipient's identity (normally the e-mail address). Because a calendar reference is included, the public key that is generated will automatically expire.

Pros

- **No certificates needed. A recipient's public key is derived from his identity.**
- **No pre-enrollment required.**
- **Keys expire, so they don't need to be revoked. In a traditional public-key system, keys must be revoked if compromised.**
- **Less vulnerable to spam.**
- **Enables postdating of messages for future decryption.**
- **Enables automatic expiration, rendering messages unreadable after a certain date.**

Cons

- **Requires a centralized server. IBE's centralized approach implies that some keys must be created and held in escrow – and are therefore at greater risk of disclosure.**
- **Requires a secure channel between a sender or recipient and the IBE server for transmitting the private key.**

Definition

Identity-based encryption (IBE) is a form of public-key cryptography in which a third-party server uses a simple identifier, such as an e-mail address, to generate a public key that can be used for encrypting and decrypting electronic messages. Compared with typical public-key cryptography, this greatly reduces the complexity of the encryption process for both users and administrators. An added advantage is that a message recipient doesn't need advance preparation or specialized software to read the communication.

A user who receives an IBE-encrypted e-mail message but has not used the process before can request — upon authentication — a private key that allows him to decrypt all e-mails encrypted using his e-mail address as the public key.

COSTS

Ferris Research looked at the costs of one commercial IBE system (from Voltage Security Inc. in Palo Alto, Calif.) and found that total cost of ownership of a typical system is one-third that of a typical public-key system. Moreover, Ferris found that IBE required a far simpler infrastructure (meaning fewer servers and easier installation). Other findings showed that operating costs were one-fifth of those of public-key systems, and that IBE users were three times more productive than users of public-key cryptography. ■

Kay *is a* Computerworld *contributing writer in Worcester, Mass. You can contact him at russkay@charter.net.*

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U.S. INNOVATION
On the Skids

Technologists look to a new administration to reverse setbacks in long-term research. By Gary Anthes

IT WOULD be hard to exaggerate the angst that has gripped the U.S. in recent weeks as markets have continued to churn and assets have melted. But the headlines that have made us dread picking up the newspaper mask a long-term problem that may shape the nation's future even more than Uncle Sam's unprecedented efforts to rescue the economy.

By most measures, the U.S. has been in a decade-long decline in global technological competitiveness. The reasons are many and complex, but central among them is the country's retreat from long-term basic research in science and technology, coupled with a surge in R&D in countries such as China.

R&D has two components, of course, and published figures showing a rise in "research *and* development" hide a troubling trend. Companies still spend billions annually on development, typically aimed at the next product cycle or two. But the kind of pure research that led to the invention of the transistor and the Internet is declining as companies bow to the pressure to improve quarterly and annual financial results.

To take but one example, Bell Labs, which was founded as AT&T Bell Laboratories in 1925, helped "weave the technological fabric of modern society," as its Web site claims. Its "top 10 innovations," according to parent company Alcatel-Lucent, include the transistor, data networking, cellular telephony, digital switching, communications satellites and Unix. Although Bell Labs continues to innovate in most of those areas, all of

the top 10 had their origins in the 1970s or earlier.

In January 1982, *Time* magazine reported, "With 22,500 people on its payroll (3,000 of them Ph.D.s), 19,000 patents and an annual budget of $1.6 billion, Bell Laboratories is a mighty engine of research and development. It is possibly the finest, and certainly the largest, private operation of its kind anywhere."

But beginning with its reorganization during the 1984 breakup of AT&T, Bell Labs has become steadily more focused on advanced development rather than pure research. On Sept. 4, New Jersey's *Star-Ledger* newspaper reported that Bell Labs was disbanding a group of scientists doing basic research in areas such as material science and device physics. The paper reported that Research Director Gee Rittenhouse had said that "the team was going to have a hard time integrating its research into product development."

WASHINGTON WATCH

The change in focus from long-term research to shorter-term development in the private sector has been mirrored in the government. While federal funding for "R&D" has not declined overall and has in fact increased since the early 1990s, it has been more and more focused on the short-term needs of government.

In particular, critics say, under the administration of George W. Bush, the Defense Advanced Research Projects Agency — which gave birth to the Internet, computer time-sharing, computer graphics, LANs and much more — has concentrated its research on short-term needs for warfare and homeland security. Today, DARPA funding tends to go to those who can promise measurable results in a year or two.

DARPA funding is now "short-term, applications-oriented, highly competitive, with small amounts of money and lots of reporting requirements," says Leonard Kleinrock, a professor of computer science at the University of California, Los Angeles, and an Internet pioneer in the 1960s. "That does not engender quality research."

In a recent bulletin to its members about the federal budget, the American Association for the Advancement of Science (AAAS) said, "Although high-priority investments in physical sciences research, weapons development and human space exploration help to keep the federal R&D outlook brighter than the bleak outlook for domestic programs overall, the FY 2009 budget continues the recent trends of declining federal support for research."

The AAAS said that the federal investment in basic and applied research would fall in real terms for the fifth year in a row under the

WHAT'S NEXT?

GOVERNMENT SUPPORT for research owes more to the specific individuals in the White House than to the political ideology of the party in power, says David Farber, a computer science professor at Carnegie Mellon University. "In the Clinton-Gore administration, the president and vice president understood technology. Al Gore loved every piece of technology he could find," he says. "But [the Bush] administration just isn't up on technology. It killed its advisory committees; it killed a lot of things. Their problems and interests were elsewhere."

President-elect Barack Obama has expressed few personal views about science and technology, but he has outlined some broad policy proposals and goals. He says he'll "change the posture of our federal government from being one of the most anti-science administrations in American history to one that embraces science and technology."

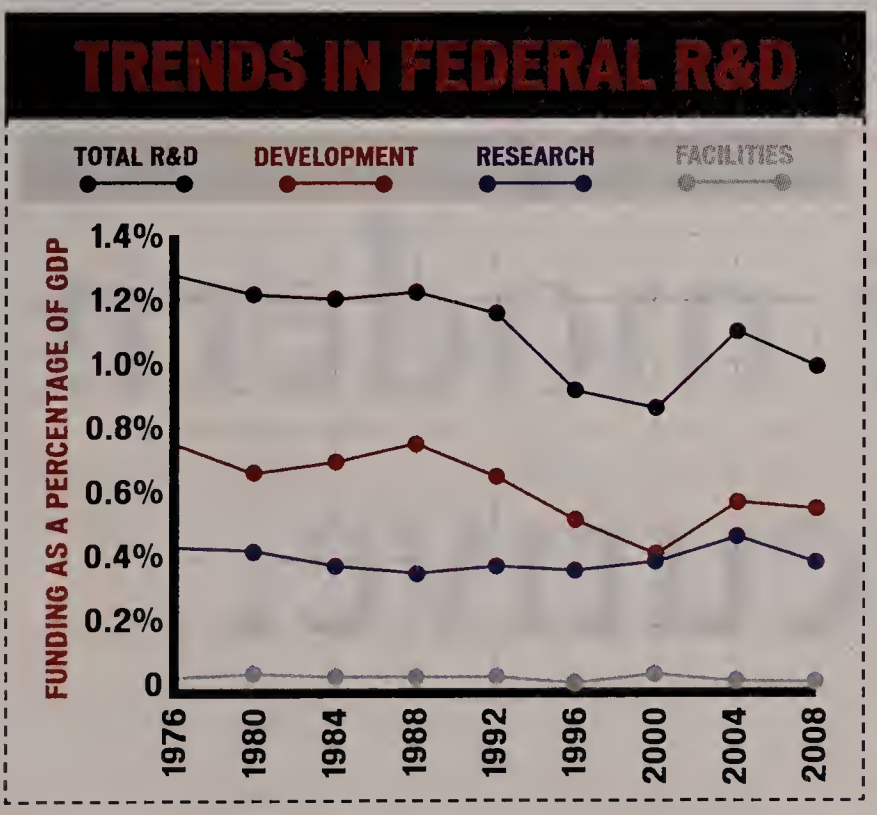
He has promised to double federal funding of basic research over 10 years, appoint the nation's first chief technology officer, make the R&D tax credit for corporations permanent and "restore the basic principle that government decisions should be based on the best-available, scientifically valid evidence and not on the ideological predispositions of agency officials or political appointees."

He has also outlined educational reforms that he says will make the U.S. more competitive in science and technology.

Of course, given the current economic climate, it's difficult to say whether these are promises Obama can keep.

– GARY ANTHES

TRENDS IN FEDERAL R&D



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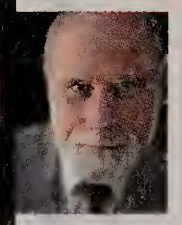

We have a significant diminution of industrial long-term research in IT, and we have seen one of the major federal sources of IT research – DARPA – essentially withdraw.

VINTON CERF, CHIEF INTERNET EVANGELIST, GOOGLE INC., AND AN INTERNET PIONEER

FY 2009 budget proposal. Meanwhile, it said, other countries, including China and Korea, are boosting government research spending by 10% or more annually.

The AAAS also presented data that shows that despite a big surge in health research funding for the National Institutes of Health between 1998 and 2003, total federal R&D spending as a percentage of gross domestic product has been in decline since 1976 (see chart, page 37). "Federal research investments are shrinking as a share of the U.S. economy just as other nations are increasing their investments," the AAAS observed.

The Technology Policy and Assessment Center at the Georgia Institute of Technology recently completed a study that compares the technological progress of 33 countries between 1993 and 2007. It concluded that China has progressed more, and more rapidly, than the other 32 countries, while the U.S. and Japan have slowly declined.

"The pattern is inexorable," says Alan Porter, one of the authors of the study. "China is coming up strongly, and it's in high-tech areas, not just cheap consumer goods." China's rise is aided by an authoritarian government, low wages and a good manufacturing base, he says, but that isn't all. "You see tremendous effort in research in China," Porter says. "The U.S. and China are neck and neck in basic science."

"We have kind of lost our way in some respects," says Vinton Cerf, chief Internet evangelist at Google Inc. and another Internet pio-

IT'S THE JOBS, Stupid

INDUSTRY HAS NOT ONLY cut back on research, but it has also taken much of it offshore, says David Farber, a computer science professor at Carnegie Mellon University. That keeps some of the best jobs away from U.S. scientists, as well as non-U.S. scientists who were educated here and want to stay, he says.

And the jobs of university researchers aren't so hot these days, either, he says, noting that professors and grad students must scramble for federal funds. "Faculty spend their careers writing proposals. They don't get funded. The hit rates are low. People put in 20 proposals in a year," Farber says.

"Once you reduce university research, you are really mortgaging your future, because the way you train new scientists is by apprenticeships at graduate schools," he adds.

Where will the apprentices turn? Eventually, Farber says, "we could all be hamburger flippers, or Wall Street brokers, if there are any left."

– GARY ANTHES

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neer. "We have a significant diminution of industrial long-term research in IT, and we have seen one of the major federal sources of IT research — DARPA — essentially withdraw from a lot of that."

Cerf says he doesn't like the word *competitiveness* because it suggests an adversarial relationship. He'd prefer that scientists and engineers work across borders to collaborate openly and publish their results.

Cerf suggests that the new administration should encourage immigration by the most talented science and engineering students. "They are the crème de la crème, because they can't get in otherwise," he says. "Maybe they [ultimately] go home, and maybe they stay, but they contribute mightily to the health of research and add a great deal of value to U.S. research initiatives."

"[University researchers] are not being pushed to get a fundamental understanding; they are looking for the answers now, for this system, for today.

LEONARD KLEINROCK, PROFESSOR, UCLA, AND AN INTERNET PIONEER

Henry Chesbrough shares that goal. "We are losing our ability to attract the best and brightest at the graduate level to come to the U.S.," says the executive director of the Center for Open Innovation at the University of California, Berkeley. "There are two reasons," he explains. "Our concerns about security and immigration have caused us to be perceived as less welcoming. And the options back in the home countries are better than they have ever been. So at precisely the time we need to be more competitive to attract and keep these people, we are pushing them away."

But attracting bright Ph.D. students is just one challenge; funding their work is another. According to the AAAS, total federal funding for R&D at universities has risen slightly recently, but, adjusted for inflation, that amount has declined in each of the past two years.

Kleinrock says he is troubled by how campus researchers are forced to take a pragmatic view to win short-term funding from DARPA. "They don't stop to ask what's behind the results they get," he says. "They are not being pushed to get a fundamental understanding; they are looking for the answers now, for this system, for today."

He says he worries that this short-term view of science will propagate from professor to student in a way that weakens subsequent generations of researchers.

Of course, given the current economic turmoil, most everyone sees other critical needs pushing R&D even further down the list of federal priorities. "Yes," Chesbrough admits, "that's going to make this deferred gratification even more difficult to accomplish." ■

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Progress at Last, And a New Priority

As a **corporate policy** on patching becomes imminent, it's time to put that matter on **the back burner** and look at the **budget.**

THIS WEEK, I got an indication that my fledgling security organization will be able to finally lay its first big initiative to rest and move on to other things. For me, that will be the budget, but before I tell you about that, I should report on the latest developments in the patching saga.

As we've sought support for building a vulnerability remediation program that has the patching of critical systems at its core, my team and I have been attacking on two fronts. I've handled the frontal assault, meeting with systems administrators and business leaders to raise awareness of the need to regularly update our systems. On the flanks, my team has been working to produce policy statements that, when signed by our senior executives, will demonstrate that we have support from the highest levels.

Progress on both fronts has been slower than I would have hoped for, but we are gaining ground. The week's best news was the approval of a patching policy by our legal department. This means that senior management is now cleared to sign the policy and thus relieve me of the ultimate responsibility for instituting patching. Our CIO has assured me he's prepared to sign off on this policy. His explicit backing should put this matter in a new light for those in the IT department who are still balking.

I honestly don't know how any experienced systems administrator in this day and age can put up resistance to a comprehensive patching program. The dangers of leaving systems unpatched overwhelm me, but they don't seem to bother a lot of our sysadmins very much.

Nonetheless, between my nearly constant jawboning on the subject and the imminent approval of the patching policy, I think we could be on the verge of winning this fight — even though at this point, the systems administrators are clearly trying to avoid me. I expect our adversaries to give in resignedly rather than come over to my point of view enthusiastically, but that's OK. Either way, we can begin the serious work of getting our systems in order.

I honestly don't know how any experienced sysadmin in this day and age can put up resistance to a comprehensive patching program.

JUST LOGISTICS

There will be plenty of work to do. We are going to have to define a process for testing patches. How and when will we deploy them? How are we going to go about catching up with several years' worth of missed patches? But although working out those details will take some skill, those are really just questions of logistics, and I'm confident we'll knock it all into shape.

So, at long last, I think I can say that kick-starting a regular patching program is no longer my top priority. Like everyone else, as the end of the year approaches, I've made budget planning my new top priority.

As I contemplate how to budget for 2009, I have to consider what's going to be best for a security organization that's still in its first year and serves an enterprise with limited maturity. I need to choose the security initiatives that will be the foundation of our risk management efforts, keeping in mind, of course, that we are in an economic climate that makes it impossible to spend freely on tools and staff.

Open-source tools are appealing, given the budgetary circumstances, but my company is too big for open source to be widely used. I'm not ruling it out, and I'll probably employ it where it makes sense, but it will have to be considered judiciously.

I figure that I will identify three to five significant components of a foundational security infrastructure, with a mix of defensive and detective controls, and focus my efforts on those. But which should I choose, and how many will ultimately be approved? I'll keep you informed as I come up with answers. ■

This week's journal is written by a real security manager, **"J.F. Rice,"** *whose name and employer have been disguised for obvious reasons. Contact him at jf.rice@engineer.com.*

Trouble Ticket

AT ISSUE: Having a regular patching program is about to become company policy.

ACTION PLAN: Keep working on this, but focus on a higher priority: the 2009 budget.

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TRBA

THE CIO AS INNOVATION CZAR

Shifting roles bring new challenges in innovation and enterprise integration.

James I. Cash Jr.

Many CEOs today are asking CIOs to play a bigger role in innovation and enterprise integration. In this month's Harvard Business Review, **James I. Cash Jr.**, *retired senior associate dean at Harvard Business School, and co-authors Michael J. Earl and Robert Morison discuss how that shift is playing out in 24 major corporations. Cash, temporarily sidelined by oral surgery, explained these new IT roles to Kathleen Melymuka via e-mail.*

Why is the CIO's role shifting? The change is based more on the capabilities of specific individuals than something inherent in an IT organization in a large company. For broad-based individuals that have used their time as CIO to demonstrate an ability to think and act systemically and in an integrative manner across the entire enterprise, companies have asked them to take on additional responsibility. The primary drivers of this trend are the need for the enterprise to pursue growth and innovation initiatives in addition to the intense focus on productivity/efficiency/compliance during the first half of the decade.

You write that two key groups leverage technology. The first is a distributed innovation group (DIG). What is that? This group only gets established if the company has committed to a belief that the source of creativity is more likely to occur outside the company boundaries than inside. This group is established to facilitate collecting, evaluating, monitoring and, in some cases, providing initial funding for the idea.

How does it work? DIG scouts for new ideas and untapped potential in current technologies, scans the external environment for emerging technology, facilitates participation in idea forums, acts as a center of expertise for support of innovation and creativity, communicates and publicizes promising ideas, and provides initial funding and scarce specialized skills that may be required for the early evaluation/testing of the idea. DIG *does not* act like a dedicated R&D group, have exclusive responsibility for all phases of the innovation process, or sit in an office developing policy and anointing winners in the fine tradition of many staff functions.

The second team is the enterprise integration group (EIG). What is that? A group responsible for transforming the corporation into an efficient participant in an industry ecosystem, primarily as a result of an external and internal business process redesign. An "outside-in" perspective on this work distinguishes this group from pure process improvement work. The key measures for this work focus on breakthrough business integration projects that radically improve the organization's performance in the eyes of customers or key suppliers. This may lead to a change in the traditional business model.

IT'S ROLE

IN THE DIG

- Providing tools that facilitate communication, collaboration, monitoring
- Providing platforms for collecting and testing ideas
- Assessing emerging technologies that relate to the ideas
- Providing cost- and risk-effective prototyping capability
- Facilitating rapid implementation of significant innovations

IN THE EIG

- Supporting cross-organizational systems implementations
- Providing expertise in information management to facilitate integration
- Providing program and project management
- Providing specialized relationship management in a multi-organizational context

What does the EIG do? It's responsible for enterprisewide business process management and improvement. [It] manages the corporate portfolio of integration initiatives, serves as center of excellence for skills required in process improvement and is responsible for new ideas on future-oriented enterprise architecture. It frequently has a major education and training responsibility.

What can it accomplish? Gary Reiner's Corporate Initiatives Group at GE was responsible for companywide implementation of Six Sigma and Lean, which eventually provided the foundation for outside-in projects that reduced lead-time for customer financing decisions from 63 days to "same-day" [financing].

What can a CIO do in his own company? Collect data and examples of how these changes have benefited other companies and sell the idea to your executive suite. Do not accept responsibility for managing the cultural change required; that belongs to the CEO or COO. (Exception: If you become the COO, then it's your responsibility.) But quickly accept the responsibility to implement these groups in support of the new approach to growth and innovation. ■

■ OPINION

Bart Perkins

Considering Consulting?

MANY IT professionals will leave large corporations over the next few years. Some will seek escape from the frustrations of corporate organizational structures, bureaucracy and politics. Others will work part time or move to more desirable locations. Many will be laid off, and some will retire. As a result, it's likely that these IT professionals, both management and technical staffers, will consider consulting as a career alternative.

There are several types of consulting firms, and they all offer various advantages and disadvantages. Before leaping into consulting, consider these differences:

■ **Large, established firms.** These companies enjoy name recognition and offer comprehensive services. Their structures, processes, policies, support functions and benefits are similar to those of any big corporation. Wages, bonuses and promotions are fairly predictable.

Unfortunately, large consultancies also harbor corporate levels of bureaucracy and office politics.

Technical staffers who move to these firms may not notice much difference on a day-to-day basis from corporate environments, except for out-of-town work and management changes with each project. But they usually have more opportunities for career growth than they would in corporate positions. However, some large consultancies still operate on an "up or out" policy: Earn promotions regularly, or leave the firm.

IT executives who join these businesses are expected to sell engagements and manage client relationships. Actual project work is delegated to staffers. An extensive set of contacts is required, and a full-time commitment is usually expected.

■ **Boutiques.** Small firms vary widely in all aspects. They usually employ fewer than 100 people, and they may consist of just a few highly talented individuals. If a boutique's partners have aligned goals, internal politics are minimized and the firm can be extremely successful. Conversely, warring partners can easily tear apart a small firm.

■ Some large consultancies still operate on an 'up or out' policy: Earn promotions regularly, or leave the firm.

Boutiques are more likely to accommodate part-time work or other quality-of-life issues, and they can finalize negotiations or make critical decisions quickly, often in a single day.

The workload, however, can be feast or famine. Virtually everyone works on client projects, and *everybody* sells. But it's difficult to sell new engagements while consulting full time, so revenues can swing wildly.

Income is correspondingly unpredictable. Many of these firms pay consultants a percentage of the fees they bill rather than a flat salary. But few have enough money to pay employees when there is no consulting work. On the

upside, many boutiques share profits with all staffers, not just partners.

If the firm provides consulting services on a wide variety of issues across industries, consultants gain extensive experience and responsibility quickly. Unfortunately, at narrowly focused firms, you may gain deep expertise but not broad experience. Few boutiques offer training programs or multiple career options, and career paths may be limited.

■ **Midsize firms.** These consultancies have various combinations of the advantages of larger and smaller firms. A big downside, though, is that the really interesting consulting contracts tend to be awarded elsewhere.

Boutiques attract work because of their specialized skills and personalized service. Large firms win contracts because their reputations protect decision-makers in case of project failure. Midsize firms typically get more prosaic assignments.

Consulting offers career alternatives for many IT professionals, but firms vary in many ways. For long-term career satisfaction, match your needs and expectations with the benefits each type of firm offers. ■

Bart Perkins *is managing partner at Louisville, Ky.-based Leverage Partners Inc., which helps organizations invest well in IT. Contact him at BartPerkins@LeveragePartners.com.*

Career Watch

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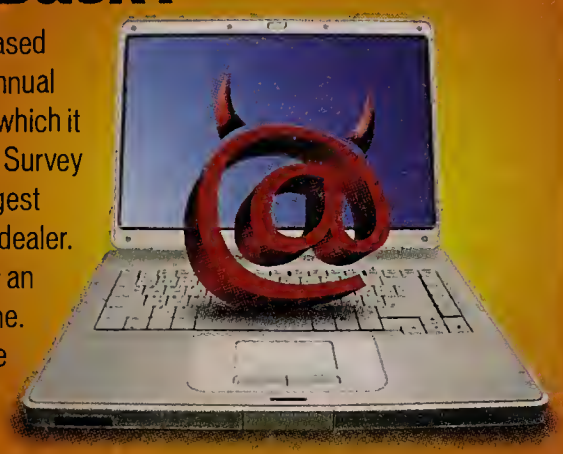

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In August, AOL LLC released the results of its fourth annual survey on e-mail usage, which it calls the Email Addiction Survey – a name that could suggest that AOL sees itself as a dealer. If checking your e-mail *is* an addiction, you're not alone. In the survey, 46% of the respondents said they were willing to acknowledge that they are hooked on e-mail, up from a mere 15% just a year earlier. Some other numbers of interest that AOL turned up:

Check e-mail more than 10 times per day	20%
Have more than 300 e-mails in your in-box	20%
Usually check work e-mail on the weekend	62%
Check e-mail while on vacation	50%
Keep smart phone near the bed so you'll know when an e-mail arrives	41%
Check e-mail in bed, in your pajamas	67%
Look at your e-mail in the bathroom	59%
Check it while driving	50%
Read e-mail while on a date	25%
Scour your in-box while in church	13%
Can't go more than one day without e-mail	17%

SOURCE: AOL MAIL SURVEY OF 4,000 E-MAIL USERS AGED 13 AND UP IN THE TOP 20 U.S. MARKETS, JUNE 2008

47% Percentage of senior IT professionals who admitted that they had accessed information that was not relevant to their roles.

SOURCE: SURVEY BY CYBER-ARK SOFTWARE LTD. OF 300 IT PROFESSIONALS AT INFOSECURITY EXPO 2008

PAGE COMPILED BY JAMIE ECKLE.

■ Q&A

Jason Seiden

The **management consultant** and **author** of *How to Self-Destruct* talks about his specialty: developing Generation X and Y talent.

Why should anyone listen to someone with a rallying cry like "Fail spectacularly!"? With generations spilling ink on "how to succeed," what do we have to show for it besides the stunning array of mediocrity that is corporate America?

Perhaps – crazy idea alert! – we should try a different approach.

When I help organizations hire, manage and develop Gen X and Gen Y talent, I start with the idea that every generation builds on the knowledge left by its predecessor but learns emotional lessons from scratch. Then I add the reality of the ego: When we look in the mirror and see people who are healthier, stronger and more knowledgeable than our predecessors, it's hard to accept that we aren't more emotionally astute, too.

I also expect that on the road from the head to the heart, the ego has blocked the way with rationalizations that move us off course. A roadblock example: "My boss is a moron." (Really? Then why aren't you CEO, Smarty-pants?) Finally, I note that frontal assaults on egos rarely work.

The resulting methodology is often ironic and humorous, but it's also highly effective at getting people to adopt a new – and more success-oriented – perspective.

So, the generation now entering the workforce is fundamentally the same as those that preceded it, with new ways to screw up? Rookies are constantly joining the game thinking they know better. The bigger issue is how economic pressures have erased rookies' allowable margin for error. The No. 1 generational question I address during presentations and coaching engagements is how to foster a learning culture with everyone under such intense pressure for results.

On second thought, your advice seems fairly conventional. Haven't we heard it all before? You bet you've heard it! I think you spent over $49 billion to have someone teach it to you last year alone!

But success isn't about what we've heard; it's about what we do. I once had an engineer in a training class note that it took two generations to go from Kitty Hawk to the moon, but that we were still struggling with basic interpersonal intelligence thousands of years after Moses introduced us to the Ten Commandments.

I don't talk to my clients' brains; I talk to their hearts. I challenge them to intellectualize less and engage more. It doesn't matter how often you hear it; you can't ever study your way to greater courage.

– JAMIE ECKLE

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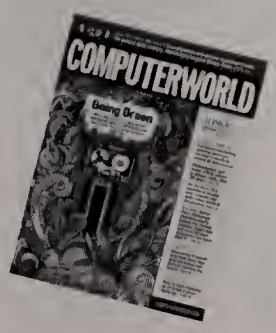

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TRUE TALES OF IT LIFE AS TOLD TO SHARKY

Color-Coordinated

Pilot fish working at a government installation gets a call from a user who complains that her network connection has stopped working. "Her office was being painted, and she said the painter disconnected her network cable from the wall. And since it was plugged back in, it won't work," says fish. "So off I go to her office. When I get there, the cable is disconnected, and I can see paint covering all the pins on the connector. The wall plate has been painted as well, and there is paint on the inside of the jack. Since the painters are still in the building, I storm off to confront them for painting over the jack. Before I get far, the user stops me and says, 'Don't yell at the painters. I asked them to paint it for me. It was ugly, and I wanted it to match the rest of the office color. Besides, I didn't think that thing did anything, anyway.' So I have to install a new connector on her cable and a new keystone jack in the wall plate. But it sure is pretty."

Think of the Savings!

Cost-conscious user calls help desk to request that her laptop be reassigned to a colleague. "I never use the laptop that I got a couple of years ago, just the computer on my desk," user says. "The laptop just sits there." A tech is dispatched to collect the laptop, but a few minutes after he takes it away, help desk pilot fish gets a new call from the user. "My computer isn't working anymore," she tells him. Is the power on to your computer? fish asks. "I'm trying to turn it on, but nothing happens when I push the power button," she says. Sighs fish, "Upon further investigation, it is found that the laptop the user 'isn't using' was connected to a dock, which was connected to her monitor – the 'computer on her desk.' So when the tech removed the laptop, he took away the laptop the user said she never used."

No Anchovies

User has a problem with her calendar in Lotus Notes, so she submits a trouble ticket – and the offshore help desk promptly responds, according to a pilot fish in the know. Tech: "I am Fred from the help desk, calling about the Domino problem you reported." User: "What?" Tech: "I am calling about the Domino issue you have." User: "I didn't order any pizza. You must have the wrong number." Tech: "No, I am calling from the help desk about your Domino problem." User: "Are you calling about the domain?" Tech: "No, it's about the Lotus Notes problem." User: "Oh, the Lotus Notes calendar problem?" Tech: "*Yes!*" Reports fish, "The Lotus Domino team did finally fix the issue, and the user is happy for now – even though she didn't get any pizza."

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Advanced Micro Devices Inc. 6, 10, 16
Alcatel-Lucent 36
American Association for the Advancement of Science 37
American Science and Engineering Inc. 16
Ames Research Center 16
AOL LLC 44
Apple Inc. 24
Bell Labs 36
BT Group PLC 10
Carnegie Mellon University 37, 38
Cedars-Sinai Medical Center 12
Chandra X-ray Observatory Center 16
Cisco Systems Inc. 8
Columbia University 30, 32
Cray Inc. 10
Cyber-Ark Software Ltd. 44
Defense Advanced Research Projects Agency 37
Dell Inc. 24
Facebook Inc. 26
Ferris Research 34
Flight Explorer Inc. 16
Gartner Inc. 6, 18
General Electric Co 42
Georgia Institute of Technology 38
Gomez Inc. 48
Google Inc. 26, 38
Hewlett-Packard Co. 6, 24
i2 Technologies Inc. 18
IBM 6, 10
IDC 18
IDG 24
IGN Entertainment Inc. 30
In-Stat 16
Intel Corp. 10, 16, 18
Jet Propulsion Laboratory 12
Kennedy Space Center 16
Lenovo Group Ltd. 24
Leverage Partners Inc. 43
LinkedIn Corp. 32
Martek Biosciences Corp. 16
McColo Corp. 10
Medical Technologies International Inc. 12
Microsoft Corp. 6, 10, 48
MIT Sloan School of Management 20
MySpace Inc. 26
National Aeronautics and Space Administration 12
National Association of Software and Service Companies 10
National Institutes of Health 38
Nortel Networks Corp. 8
Nvidia Corp. 24
Oak Ridge National Laboratory 10
PCI Security Standards Council 6
ReputationDefender Inc. 26, 32
ReputationHawk.com 26
Rotten Tomatoes 26, 30
SAP AG 18
Silicon Graphics Inc. 12
Society for Information Management 8, 18
Stahl Farella LLC 8
Stanford University 12
Stevens Institute of Technology 8, 18
Sun Microsystems Inc. 8, 18
Sunlane Media LLC 32
Surtreat International LLC 16
The Aspen Skiing Co. 8
The Dannon Co. 8, 18
Third Avenue Management LLC 8
Toshiba Corp. 24
U.S. Census Bureau 6
U.S. Department of Energy 10
University of California, Berkeley 39
University of California, Los Angeles 37
University of Chicago Medical Center 12
University of Tennessee 10
Voltage Security Inc. 34
Yahoo Inc. 26

ADVERTISERS' INDEX

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accenture.com/outsourcing
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www.bigfix.com/agent
Business Objects ..... 23 *
www.businessobjects.com/workless
CDW Corporation 25
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InterSystems.com/Connect5A
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Frank Hayes

A Nasty Refresh

YOUR IT shop is about to be forced into a technology refresh. You don't have a choice. You can't stop it. You can't put it off until the economy gets better. You can't scale it back. You don't even get to decide what products your users will move to.

And nasty as that may sound, you'll be a lot better off dealing with this refresh now — before it's totally out of your control.

The refresh: Web browsers — in particular, the browsers that customers use to see your corporate Web sites.

Maybe that sounds trivial. Internet Explorer, Firefox and Safari have been around for years. How tough could the transition to the new versions be?

Tough enough, according to Imad Mouline. He's the CTO at Gomez Inc., which tests Web sites to see how quickly and consistently they appear in a browser. A few weeks ago, he bent my ear about the challenges facing Web sites that get their content from multiple sources that only comes together at the user's browser — for example, online publications whose ads come from a third party.

With content coming from different servers that may be located in different parts of the world, users in different places may have different experiences of how fast a Web site loads and responds, even if they're using exactly the same kind of browser and computer, Mouline told me. Add in all the different browser and hardware possibilities, and user experience is all over the map.

OK, I thought, fair enough. But that's not something most corporate IT shops are much concerned with. When we set up Web applications for our users, we control what browsers and machines they use. When we host corporate Web sites, we just have to make sure they've been tested with popular browsers and make sure we keep the servers running — right?

If your Web servers are optimized for the browsers in wide use today, they're about to get hammered.

Wrong. According to Mouline, the new versions of IE, Firefox and Safari change those requirements.

As usual, the new browsers have "improvements" (some of which really *are* improvements) that mean Web sites may render differently. That's a test-and-tweak problem for Web developers — no big deal for IT.

But the new generation also changes how browsers get their content. Older browsers made two connections to a server at a time; for example, an image and a JavaScript file could load in parallel.

The new browsers triple that to *six* connections per host.

So if your Web servers are optimized for the number of connections you currently expect with peak traffic, they're about to get hammered as the new browsers arrive.

And it may not end with server configuration. Everything else in your infrastructure may require some rethinking to handle the extra connection load.

And that doesn't take into account new kinds of content, such as video and animation, that the new browsers make easier for Web developers to use. Both the number of connections *and* the data load may jump.

If you're not prepared, you know *exactly* who will get the blame for your newly sluglike Web site.

Sounding more like a technology refresh now?

Yeah, it's a lousy time to vet your infrastructure for new problems — just when your budget and staff are facing a trim. It's a bad time for any project you don't have much control over. But like it or not, the refresh is coming.

So don't wait. Do it now. Today, less than 20% of Web traffic comes from these new-wave browsers. But sometime before the end of 2008, Microsoft will begin pushing the new version of IE to users. That's when the tsunami hits.

By then, you'd better be ready.

Otherwise, you'll find out just how nasty a technology refresh can be. ■

Frank Hayes *is Computerworld's senior news columnist. Contact him at frank_hayes@computerworld.com.*

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